



Modular RICH Simulation -- Delta Ray Electron

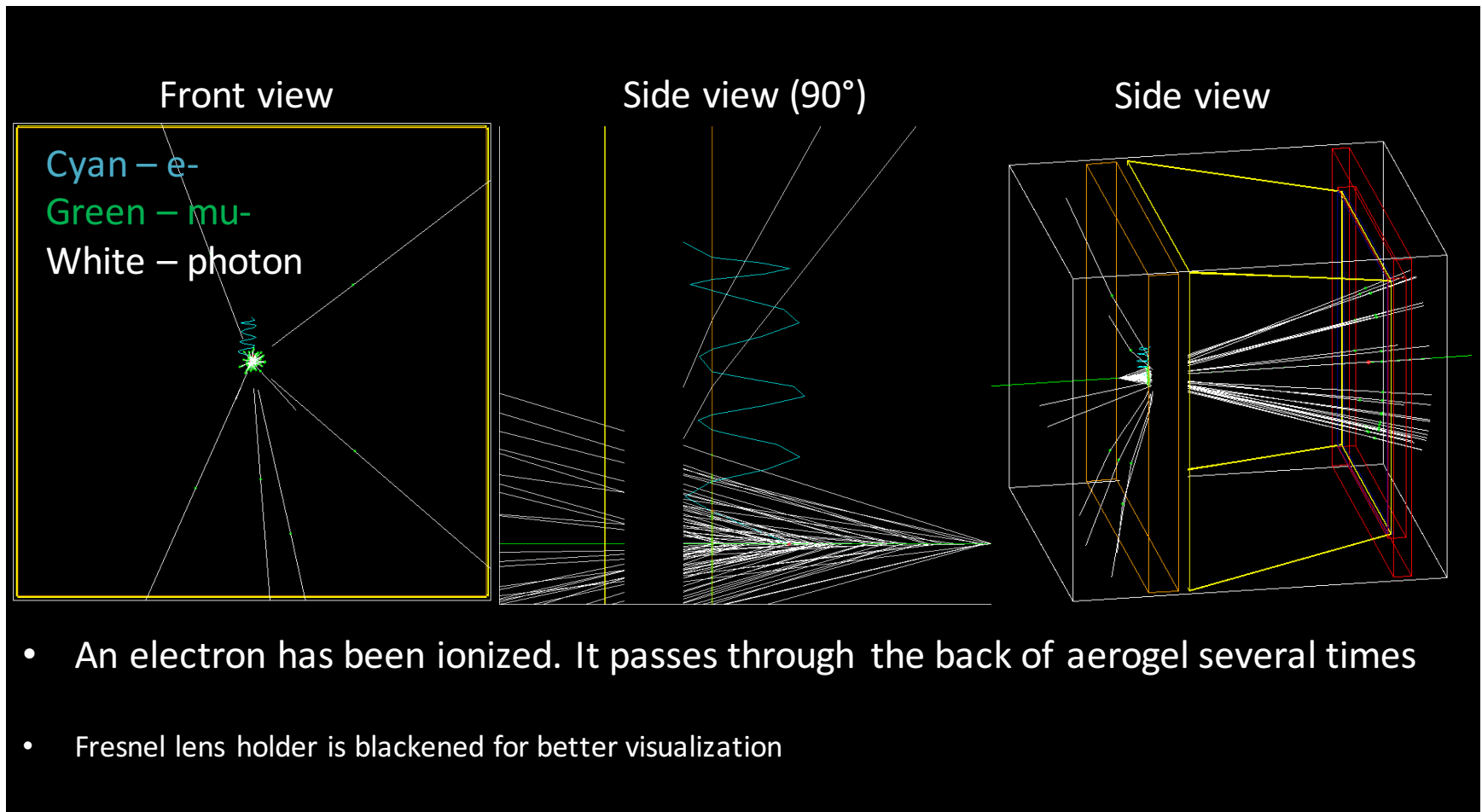
Cheuk-Ping Wong
Georgia State University
12-07-2015



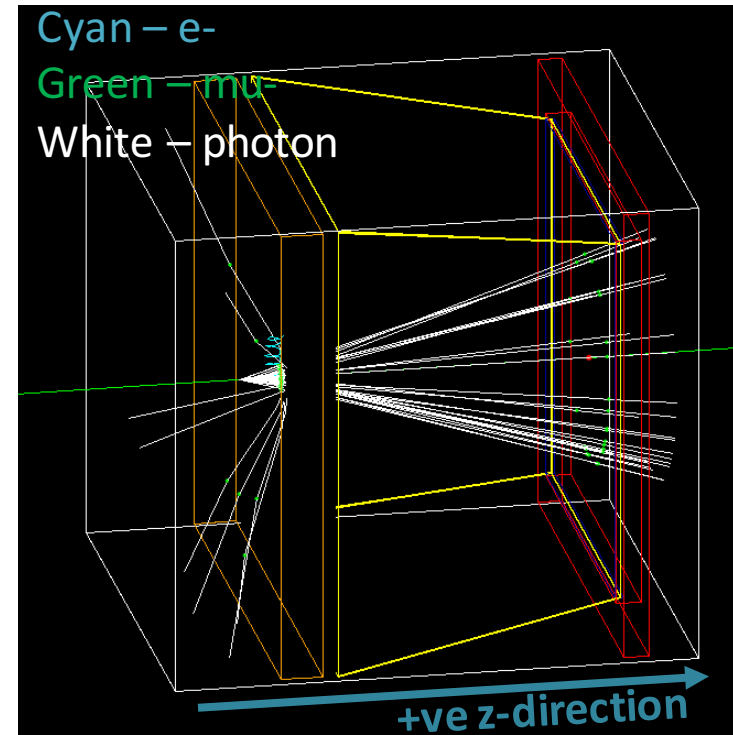
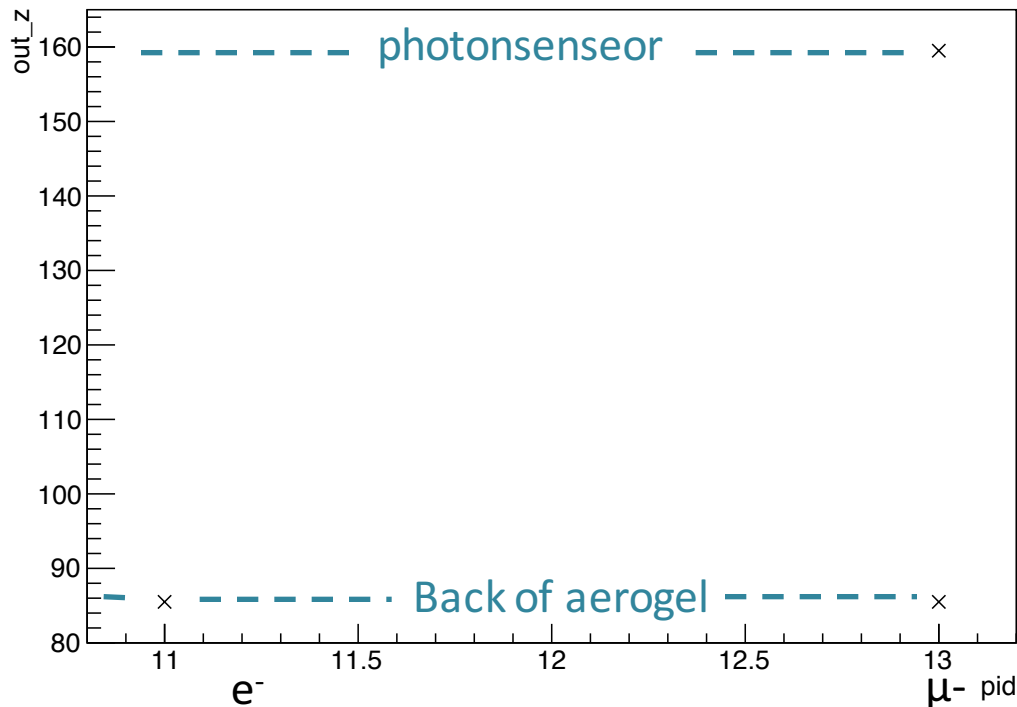
Simulation Setup

- Single Muon, 20GeV
- Aerogel
 - 1 cm thick
 - Refractive index=1.05
- Magnetic field
 - $(B_x, B_y, B_z)=(0, 1.5, 0)\text{T}$
- Hit type = eic_rich

Event Display



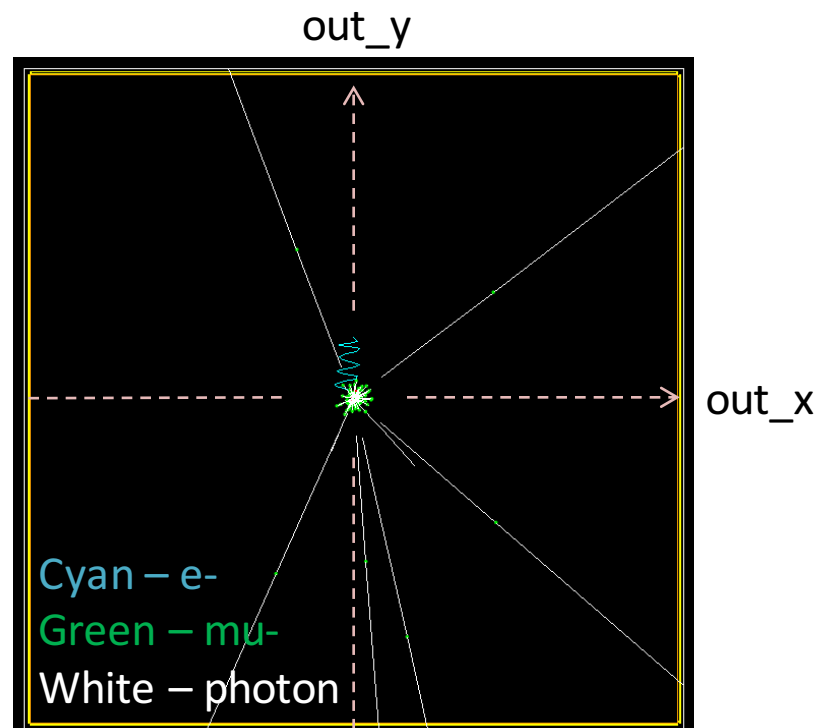
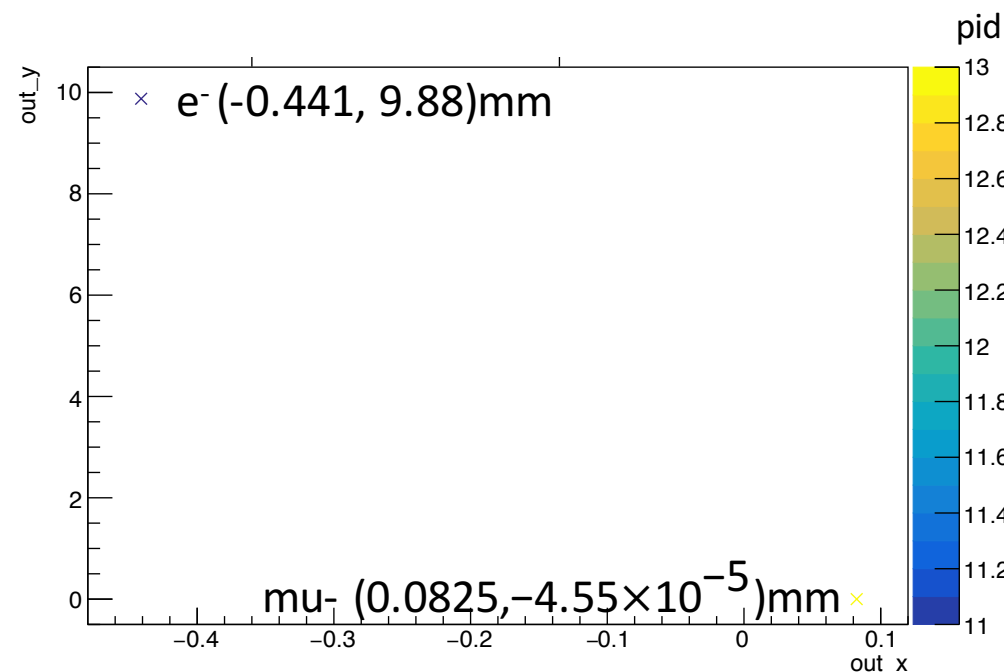
z-position of Hits (Non-Photon)



Z-Position of Hits vs. PID

- Two entries of muon hits
 - At the back of aerogel
 - photonsensor
- One entry of delta ray e-
 - At the back of aerogel

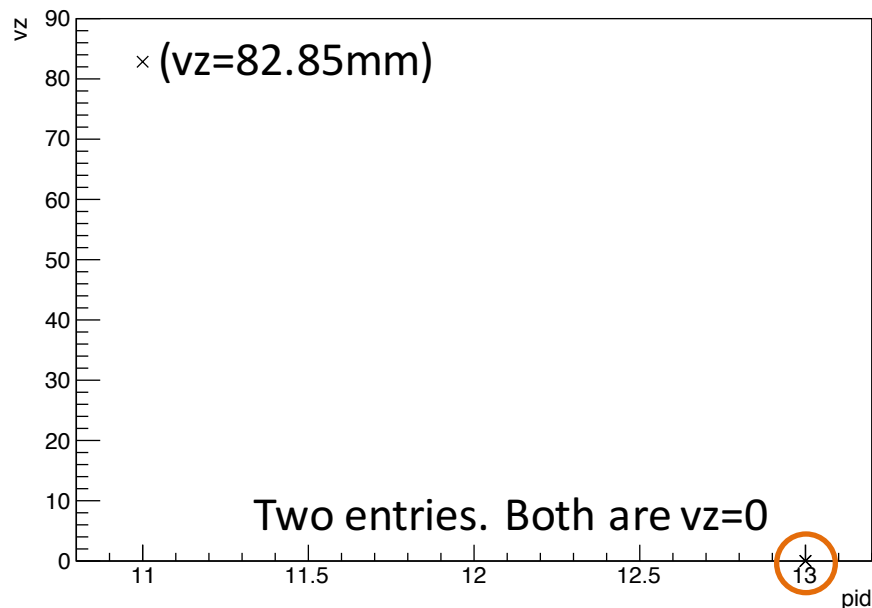
Hit Position at the Back of Aerogel (Non-Photon)



Hit Position at the back of aerogel: out_y VS. out_x

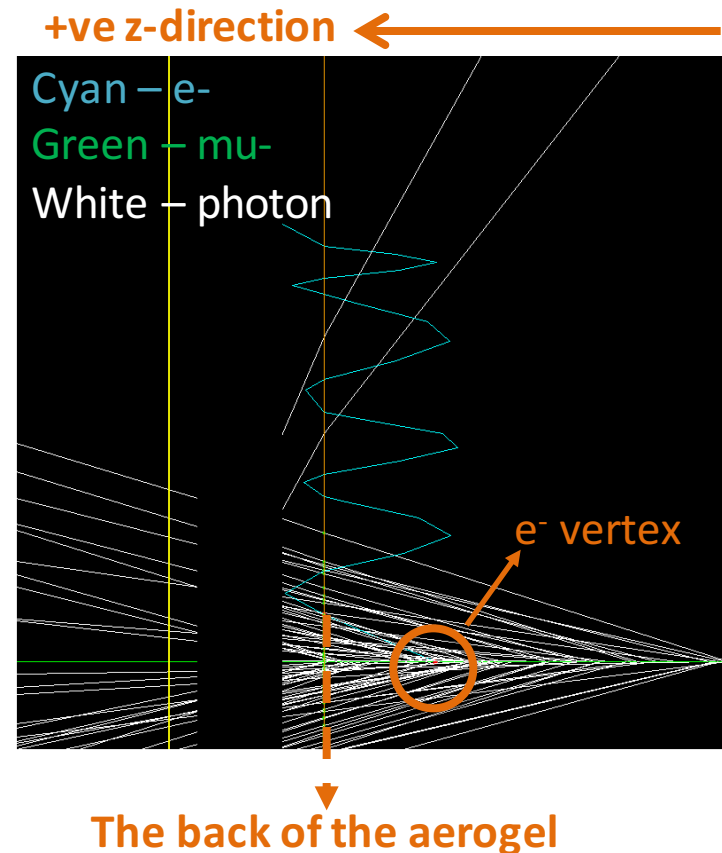
- mu- hit is close to the origin of x-y plane
- E- hit is at a higher y-position which matches the event display (shown on the right)

Z-position of Vertex (non-photon)



Vertex of delta ray electron – V_z VS. PID

- Two entries of vertex position are recorded for muon. Both are at $v_z = 0$ which is the launching position of muon
- One entry of e^- vertex position are recorded





Summary

- A single particle can create more than one hits with **different hit positions (out_z)**
 - However, there will be redundant record of vertex (vz)
- Hit position cut is needed to reduced double count



Next

- What if the particle re-enter the aerogel?
 - Extra out_z recorded?